Artham Resource Material

For Revised Syllabus Session 2024-25

NCERT Solutions

CHEMISTRY

Chapter 4 Acids, Bases and Salts

Class 7

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Chapter – 4

Acids, Bases and Salts

Exercise

1. State differences between acids and bases.

Answer:

Differences between acids and bases are as follows:

Acids	Bases
Acids turn blue litmus to red.	Bases turn red litmus to blue.
Acids are sour in taste.	Bases are bitter in taste
Chemical nature of such substances is acidic.	The chemical nature of such substances is said to be basic.
They are not soapy to touch.	They are soapy to touch.
Example: Hydrochloric acid, acetic acid.	Example: Soaps at our homes, Sodium Hydroxide.

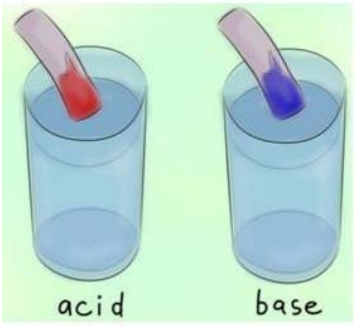
2. Ammonia is found in many house-hold products, such as window cleaners. It turns red litmus blue. What is its nature?

Answer:

The substances that turn red *litmus** to blue are basic in nature. Ammonia also turns red litmus to blue. Thus, it is basic in nature.

$NH_3 + H_2O \rightarrow NH_4^+ + OH^-$

litmus*: Litmus is a dye that becomes red in acidic conditions and blue under alkaline conditions as shown in the pic below:



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3. Name the source from which litmus solution is obtained. What is the use of this solution?

Answer:

Litmus is most commonly used natural indicator which is extracted from lichens*. Litmus solution has mauve (purple) colour in distilled water. It is used as an indicator to distinguish between acids and bases. When acidic solution is added in it, it turns red and when basic solution is added, it turns blue.

Lichen* *is a symbiotic relationship between algae and fungi.*

4. Is the distilled water acidic/basic/neutral? How would you verify it?

Answer:

The solutions which do not change the colour of either red or blue litmus are known as neutral solutions. When the nature of distilled water is tested with litmus paper, we have found neither red or blue changes in the colour which verify its neutral nature.

5. Describe the process of neutralization with the help of an example.

Answer:

The reaction between an acid and a base is known as neutralization. Neutralization reaction result in the formation of salt and water. During this reaction, energy in the form of heat is evolved.

Acid + Base → Salt + Water + Heat

Example: When sodium hydroxide (NaOH) is added to hydrochloric acid (HCl), sodium chloride (NaCl) and water are obtained.

$$\underset{\text{Sodium Hydroxide}}{NaOH} + \underset{\text{Hydrochloric acid}}{HCl} \rightarrow \underset{\text{Sodium chloried}}{NaCl} + \underset{\text{Water}}{H_2O} + Heat$$

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6. Mark "T" if the statement is true and "F" if it is false:

i. Nitric acid turns red litmus blue. (T/F)

ii. Sodium hydroxide turns blue litmus red. (T/F)

iii. Sodium hydroxide and hydrochloric acid neutralize each other and form salt and water. (T/F)

iv. Indicator is a stub stance which shows different colours in acidic and basic solutions. (T/F)

v. Tooth decay is caused by the presence of a base. (T/F)

Answer:

7. Dorji has a few bottles of soft drink in his restaurant. But, unfortunately, these are not labelled. He has to serve the drinks on the demand of customers. One customer wants acidic drink; another wants basic and third one wants neutral drink. How will Dorji decide which drink is to be served to whom?

Answer:

Since the drinks are edible, Dorji can take decision by testing the drinks. Acidic drinks will be sour in taste whereas basic drinks will be bitter in taste and neutral drinks will have no taste.

Dorji can decide which drink is acidic by taking the litmus test:

(i) If drink turns blue litmus paper to red, then it is acidic in nature and hence it will be served to first customer who wants acidic drink.

(ii) If drink turns red litmus paper to blue, then the drink is basic and hence it will be served to another customer who wants basic drink.

(iii) If drink does not show change in colour, then it will be neutral drink and hence it will be served to third customer who wants neutral drink.

8. Explain why:

a. An antacid tablet is taken when you suffer from acidity.

b. Calamine solution is applied on the skin when an ant bites.

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c. Factory waste is neutralized before disposing it into the water bodies.

Answer:

a. Antacid is a substance that neutralizes the acidity in the stomach because it contains bases. We take antacid such as milk of magnesia, which contains magnesium hydroxide. These bases react with excess of acids released in stomach and neutralize their effects, thus giving us relief.

b. The sting of an ant contains formic acid. When an ant bites, it injects the formic acid into the skin which causes the burning sensation. The effect of acid can be neutralized by applying a base to it. Thus, by applying calamine solution which contain a base called zinc carbonate will neutralize the formic acid and relives us from the pain.

c. The wastes of many factories contain acids. If they are directly disposed into waters then, the water will become acidic and it will harm the aquatic life i.e. plants and animals inside the water. The acid can even kill the fish and the organism under water. Hence, these factory wastes are neutralized with basic substances before disposing to water bodies.

9. Three liquids are given to you. One is hydrochloric acid; another is sodium hydroxide and third is a sugar solution. How will you identity them? You have only turmeric indicator.

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Answer:

Turmeric is a **natural indicator**. Turmeric solution turns red, when it comes in contact with bases. It is not affected by acids and neutral substances.

Applying turmeric solution to the test tube, the results are:-

(1) **test tube A (Hydrochloric acid)**: No, change will happen since turmeric is not affected by acids and HCL is an acid

(2) **test tube B (sodium hydroxide)**: Yes, turmeric will change its colour to red since sodium hydroxide is basic nature.

(3) **test tube c (sugar solution)**: NO, change will happen as sugar solution is neither basic nor acidic in nature

Hence, we can only identify basic solution using turmeric as an indicator

10. Blue litmus paper is dipped in a solution. It remains blue. What is the nature of the solution? Explain.

Answer:

The blue litmus paper is an indicator which turn red when come in contact with acidic solution with pH < 4.5 since, blue litmus paper does not change its colour when placed in contact with solution this means that solution is either basic or neutral in nature.

11. Consider the following statements:

a. Both acids and bases change colour of all indicators.
b. If an indicator gives a colour change with an acid, it does not give a change with a base.
c. If an indicator changes colour with a base, it does not change colour with an acid.
d. Change of colour in an acid and a base depends on the type of the indicator.

Which of these statements are correct?

i. All four
ii. a and b
iii. b and c
iv. Only d

Answer:

All indicators do not change colour with acids as well as bases, e.g. turmeric changes its colour to pink with base but it remains yellow

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with acid. Litmus paper, methyl orange are some indicators which changes colour with both acids and bases.

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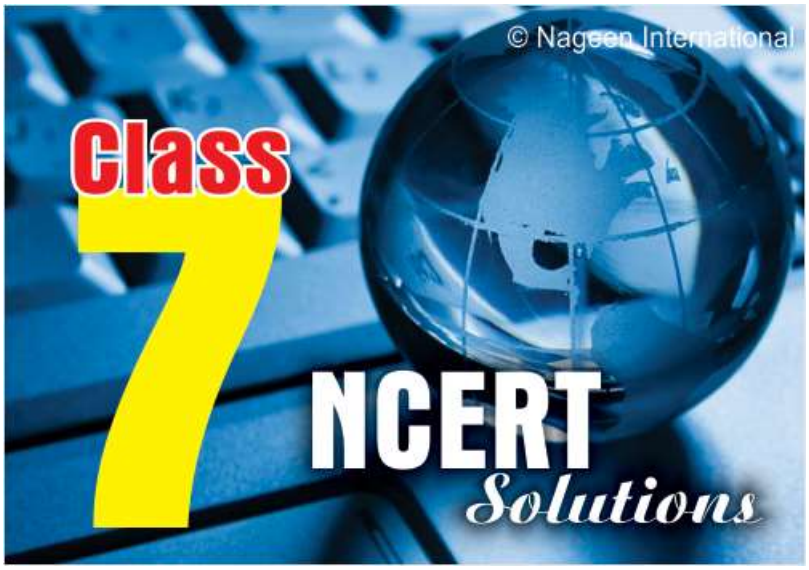

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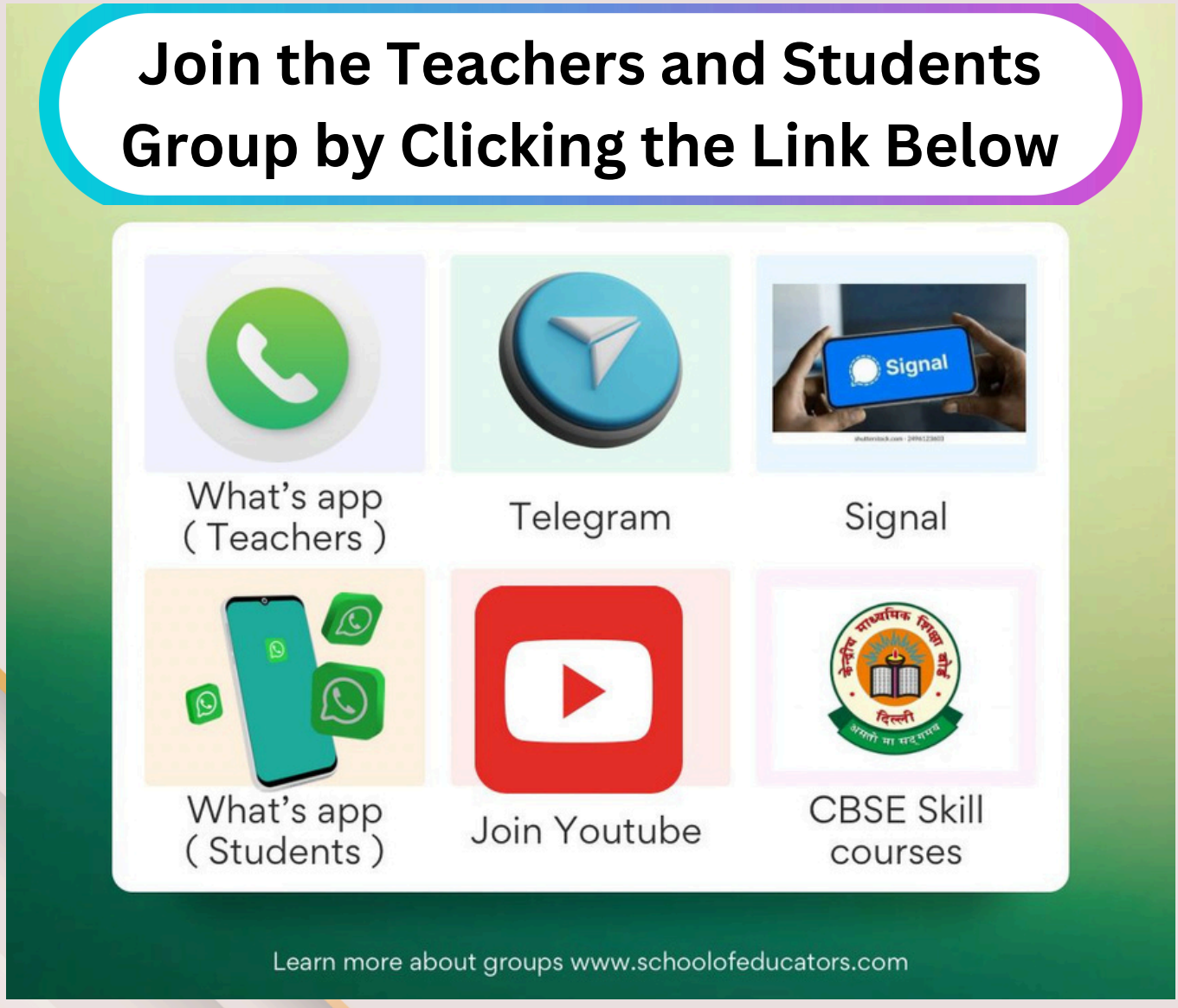
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Class 4

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Class 6

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Class 8

Class 9

Class 10

Class 11 (Science)

Class 11 (Humanities)

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Secondary Groups (IX & X)

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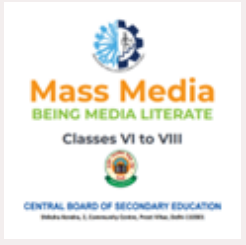
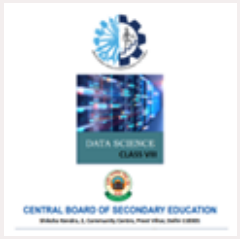


Mass Media - Being Media Literate

Travel & Tourism

Coding



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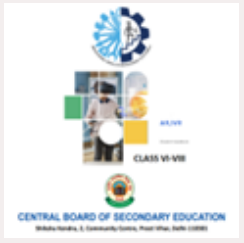
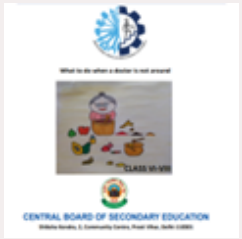


Augmented Reality / Virtual Reality

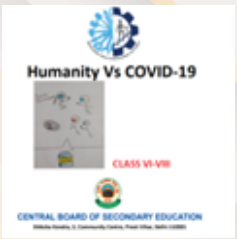
Digital Citizenship

Life Cycle of Medicine & Vaccine

Things you should know about keeping Medicines at home

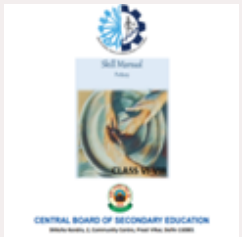


What to do when Doctor is not around



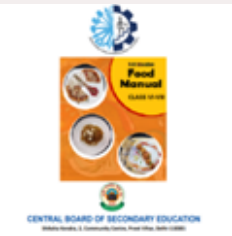
Humanity & Covid-19

Blue Pottery

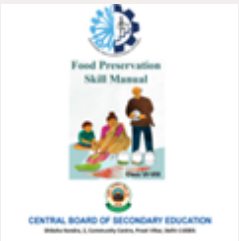


Pottery

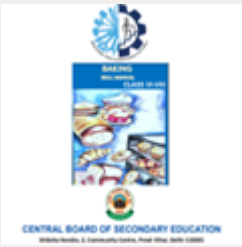
Block Printing



Food



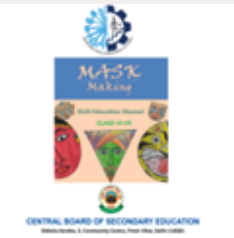
Food Preservation



Baking

Herbal Heritage

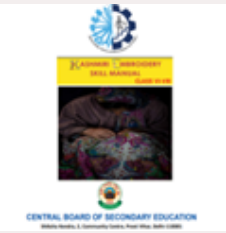
Khadi



Mask Making

Mass Media

Making of a Graphic Novel



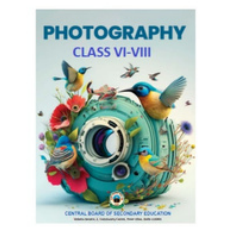
Kashmiri Embroidery

Embroidery

Rockets

Satellites

Application of Satellites



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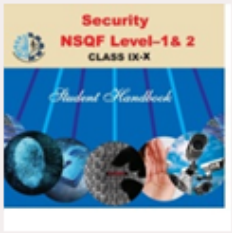
Retail

Information Technology



Security

Automotive

Introduction To Financial Markets

Introduction To Tourism

Beauty & Wellness

Agriculture

Food Production

Front Office Operations

Banking & Insurance

Marketing & Sales

Health Care

Apparel

Multi Media

Multi Skill Foundation Course

Artificial Intelligence

Physical Activity Trainer

Data Science

Electronics & Hardware (NEW)

Foundation Skills For Sciences (Pharmaceutical & Biotechnology)(NEW)

Design Thinking & Innovation (NEW)

SKILL SUBJECTS AT SR. SEC. LEVEL (CLASSES XI – XII)

Retail

InformationTechnology

Web Application

Automotive

Financial Markets Management

Tourism

Beauty & Wellness

Agriculture

Food Production

Front Office Operations

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Marketing

Health Care

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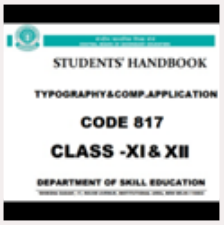

Typography & Comp. Application

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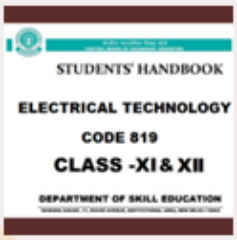
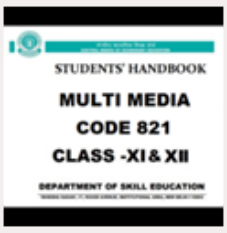


Electrical Technology

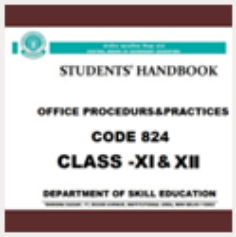
Electronic Technology



Multi-Media

Taxation

Cost Accounting



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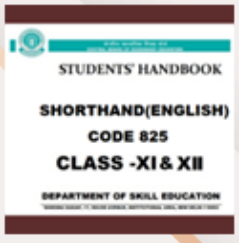

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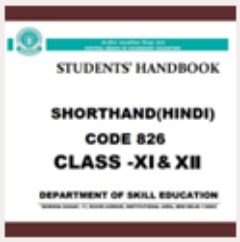
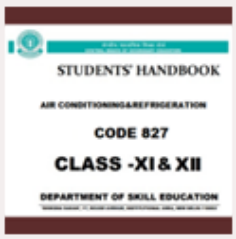
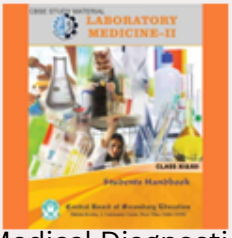


Shorthand (Hindi)



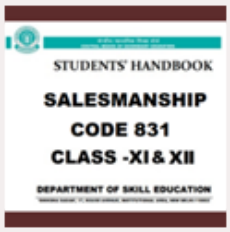
Air-Conditioning & Refrigeration



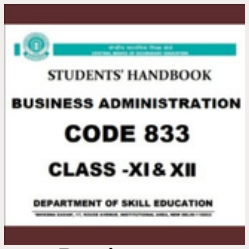
Medical Diagnostics

Textile Design

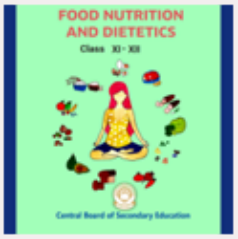
Design



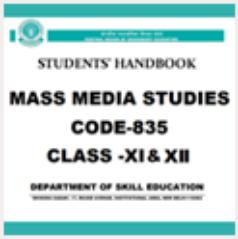
Salesmanship



Business Administration



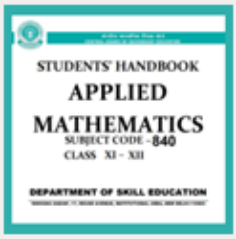
Food Nutrition & Dietetics



Mass Media Studies

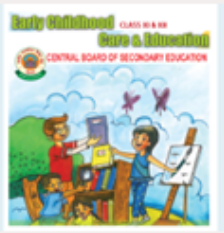
Library & Information Science

Fashion Studies



Applied Mathematics

Yoga

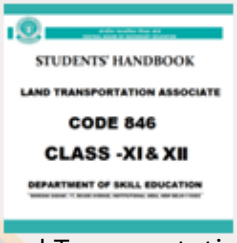


Early Childhood Care & Education

Artificial Intelligence

Data Science

Physical Activity Trainer(new)



Land Transportation Associate (NEW)

Installation Technician Computing and Peripherals
Sector: Electronics and Hardware
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Electronics & Hardware (NEW)

Design Thinking & Innovation (NEW)

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Science

English

Hindi-A

Hindi-B

IT Code-402

IT

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Chemistry

English

Mathematics

Biology

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Class 8

Join us on Telegram

Class 9

Join us on Telegram

Class 10

Join us on Telegram

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Class 11 (Com)

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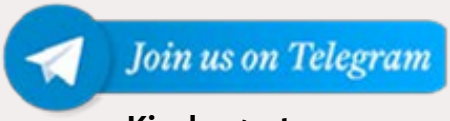
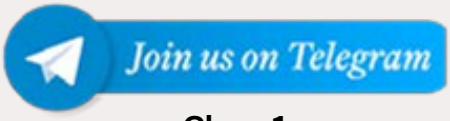
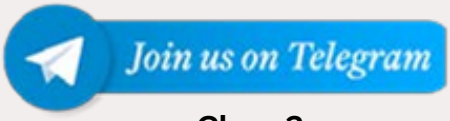


Kindergarten



Class 1



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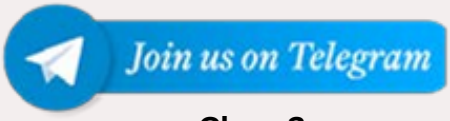

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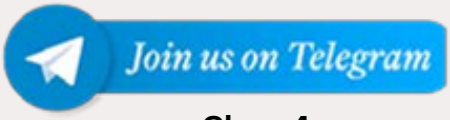

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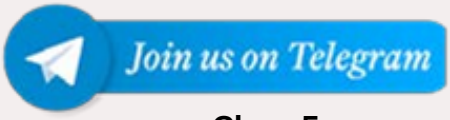
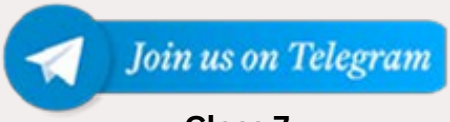


Class 5

Class 6



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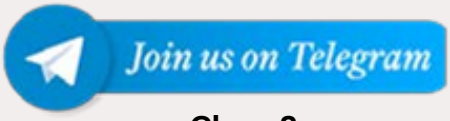

Class 8

Class 9

Class 10

Class 11 (Sci)

Class 11 (Com)

Class 11 (Hum)

Class 12 (Sci)

Class 12 (Com)

Class 12 (Hum)